Lunar Orbit Graphing

Objective: To graph using polar coordinate paper the orbit of the Moon for January 2003.

Materials: Polar graph paper, January position data, colored pencil.

Procedure: You will prepare a graph that shows the path of the Moon around the Earth. Label the points in the orbit that correspond to Apogee and Perigee.

1. Using the polar coordinate paper provided, observe the position of each day of the month and the values labeled for the distances in space from the "Earth" which is located in the center.

2. Using the data, date and distance (x 10^4 km) from the Earth for the Moon, plot the positions of the Moon as it orbits the Earth for one month.

3. When you have all dates plotted, connect the dates with a line and label the position of apogee and perigee.

<u>Observations:</u>

- What do you observe is the shape of the orbit of the Moon around the Earth?

- Discuss what happens to the apparent size of the moon at perigee and apoge

- Does the actual size of the diameter of the Moon change when you observe it from Earth?

<u>Further Investigation:</u>

• You will notice that the orbit of the moon doesn't return to the same position on Feb. 2nd.   What happens to the orbit during February? March? April?
Does it ever return to the same "January orbit"?
Using "Lunar Phase Pro Software" or Starry-Starry Night software find the distance to the moon for other months, graph them and find out.

• Investigate the "optical illusion" that occurs when the Moon rises or sets with resources on the Internet.

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Distance to Moon X 10^4 Km

	A	B
1	Jan 2	37.4
2	Jan 3	37.8
3	Jan 4	38.3
4	Jan 5	38.3
5	Jan 6	39.3
6	Jan 7	39.7
7	Jan 8	40
8	Jan 9	40.3
9	Jan 10	40.4
10	Jan 11	40.4
11	Jan 12	40.3
12	Jan 13	40
13	Jan 14	39.7
14	Jan 15	39.3
15	Jan 16	38.8
16	Jan 17	38.4
17	Jan 18	38
18	Jan 19	37.6
19	Jan 20	37.4
20	Jan 21	37.2
21	Jan 22	37
22	Jan 23	37
23	Jan 24	37
24	Jan 25	37.1
25	Jan 26	37.2
26	Jan 27	37.3
27	Jan 28	37.5
28	Jan 29	37.7
29	Jan 30	38
30	Jan 31	38.3
31	Feb 1	38.7